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KEISER,H.W. Pennsylvania Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
BUTLER,W.R. Project Directorate I-2

SUBJECT: Discusses util Cycle 4 stability data consisting of full core of ANF 9x9 fuel.

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M-A-4

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RIDS/ADDS

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Harold W. Keiser
Senior Vice President-Nuclear
215/770-4194

FEB 28 1990

Director of Nuclear Reactor Regulation
Attention: Dr. W. R. Butler, Project Director
Project Directorate I-2
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
UNIT 2/CYCLE 4 STABILITY DATA
PLA-3344 FILES R41-2, A7-8C Docket No. 50-388

Reference: Letter from M.C. Thadani (NRC) to H.W. Keiser (PP&L), "Technical Specification Changes To Support Cycle 4 Operation (TAC No. 73588)", dated November 3, 1989.

Dear Dr. Butler:

The NRC Safety Evaluation for Susquehanna SES Cycle 4 stated that stability measurements should be made during initial startup and when reasonably possible during the cycle and the data should be presented to the NRC. The Susquehanna SES Unit 2 Cycle 4 consists of a full core of ANF 9x9 fuel.

A tape containing one file of GETARS data that was recorded during the Unit 2 Cycle 4 beginning of cycle stability testing is being sent under separate cover to our NRC Project Manager. This file contains the following data points stored in engineering units at every 0.033 seconds: Time, APRM A, APRM B, APRM C, APRM D, APRM E, APRM F, Total Core Flow, and Narrow Range Pressure. The tape contains IBM standard labels and a density of 6250 BPI. In addition, a POWERPLEX edit which was taken at the beginning of the test and a sample JCL listing that may be used to read the tape are enclosed.

PP&L also plans to obtain neutron flux noise data near the end of the cycle. In addition, if during the cycle a plant evolution or maintenance activity requires the plant to operate near the instability region for a few hours, noise data will be obtained. All stability data obtained during the Unit 2 Cycle 4 operation will be provided to the NRC.

A001
1/1

If you need additional data or information regarding the test, please contact Mr. R.R. Sgarro (215-770-7916). Also we request a copy of any analysis performed by you or your contractors as a result of using this data.

Very truly yours,

H. W. Keiser

Enclosures

cc: NRC Document Control Desk (original)
NRC Region I
Mr. G. S. Barber, NRC Sr. Resident Inspector
Mr. M. C. Thadani, NRC Project Manager

VOLUME SERIAL: 012394
IBM STANDARD LABEL
6250 BPI
1 FILE

CONTENTS OF TAPE 012394

FILE	DATA SET NAME	LRECL	BLKSIZE	RECFM
1	TEST.GETARS.DATA	8504	17012	VB

SAMPLE JCL TO UNLOAD TAPE 012394

```
//       JOBCARD
//S1 EXEC PGM=IEBGENER,REGION=500K,TIME=10,PARM='IBM'
//SYSIN DD DUMMY
//SYSPRINT DD SYSOUT=*
//SYSUT1 DD DSN=TEST.GETARS.DATA,DISP=(OLD,KEEP),
// DCB=(BLKSIZE=17012,LRECL=8504,RECFM=VB),UNIT=3420,
// VOL=(,RETAIN, , ,SER=012394),
// LABEL=(1,SL)
//SYSUT2 DD DSN=PPL.GETARS.DATA,UNIT=SYSDA,
// DISP=(NEW,CATLG),DCB=(BLKSIZE=17012,LRECL=8504,RECFM=VB),
// SPACE=(17012,(1500,1500),RLSE)
```

```
*****************************************************************************
*                          DATA FOR SUSQUEHANNA  2                          *
*                         OPERATING STATE FILE EDIT                         *
*                                                                           *
*  P D/T -   BEGIN                          H D/T -   BEGIN                 *
*        89DEC08-23.00.06                              89DEC08-21.54.18     *
*                          CORE EXPOSURE =    300.77                        *
*                          CYCLE MWDE    =  13005.46                        *
*                          CYCLE MWDT    =  39794.46                        *
* NUMBER OF SCANS IN OPSTATE    =    5    TRIGGER EVENT # FOR OPSTATE        *
*                                        0000000000 1000000000 0000000000   *
*  P D/T -   END-OPS                        H D/T -   END-OPS                *
*        89DEC08-23.04.06                              89DEC08-23.04.06     *
*                                                                           *
*****************************************************************************
```

+ CONTROL ROD NOTCH POSITIONS FOR SUSQUEHANNA 2 +
+ (PROCESS COMPUTER COORDINATES) +

	02	06	10	14	18	22	26	30	34	38	42	46	50	54	58	
59					--	--	--	--	--	--	--					59
55				--	--	--	--	--	--	--	--	--				55
51			--	--	42	--	14	--	14	--	42	--	--			51
47		--	--	--	--	--	--	--	--	--	--	--	--	--		47
43	--	--	42	--	20	--	40	--	40	--	20	--	42	--	--	43
39	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	39
35	--	--	14	--	40	--	10	--	10	--	40	--	14	--	--	35
31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	31
27	--	--	14	--	40	--	10	--	10	--	40	--	14	--	--	27
23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	23
19	--	--	42	--	20	--	40	--	40	--	20	--	42	--	--	19
15		--	--	--	--	--	--	--	--	--	--	--	--	--		15
11			--	--	42	--	14	--	14	--	42	--	--			11
07				--	--	--	--	--	--	--	--					07
03					--	--	--	--	--	--	--					03
	02	06	10	14	18	22	26	30	34	38	42	46	50	54	58	

*** CONTROL ROD SEQUENCE : A-1 ***

+ LPRM READINGS - UNCALIBRATED FOR SUSQUEHANNA 2 +
+ (PROCESS COMPUTER COORDINATES) +

	(1657)	(2457)	(3257)	(4057)		
	12.1	15.3	16.2	14.5		
	18.0	22.3	22.6	22.3		
	23.0	26.2	28.1	27.5		
	25.8	38.1	36.6	34.7		
(0849)	(1649)	(2449)	(3249)	(4049)	(4849)	
13.8	23.3	22.6	23.4	21.3	16.1	
20.5	29.8	28.8	-0.1	29.1	25.4	
24.4	33.1	30.5	29.0	31.7	30.5	
25.9	35.3	30.7	33.6	33.5	34.2	
(0841)	(1641)	(2441)	(3241)	(4041)	(4841)	(5641)
16.3	22.7	24.6	18.1	20.7	21.8	14.5
25.8	31.4	34.2	31.3	34.8	31.0	22.7
29.0	29.5	35.0	32.8	32.5	33.3	27.1
35.4	33.0	35.4	35.3	33.6	35.8	39.0
(0833)	(1633)	(2433)	(3233)	(4033)	(4833)	(5633)
21.6	23.9	26.7	28.2	22.3	21.8	16.3
26.0	31.9	29.8	30.6	32.5	-0.2	22.6
28.6	38.3	-0.4	30.2	34.5	29.7	27.1
34.2	34.3	35.2	39.8	36.8	33.3	36.5
(0825)	(1625)	(2425)	(3225)	(4025)	(4825)	(5625)
18.0	23.5	26.9	26.1	24.2	19.7	13.2
24.0	33.6	31.9	31.0	33.7	27.6	20.3
26.4	36.2	33.3	30.0	35.6	28.7	24.6
32.0	35.4	36.1	35.0	-0.1	32.7	34.6
(0817)	(1617)	(2417)	(3217)	(4017)	(4817)	(5617)
16.3	21.0	22.6	24.4	22.0	19.1	11.7
26.8	30.6	33.2	34.0	31.8	29.9	18.0
31.4	27.6	27.1	36.0	30.6	34.6	22.8
32.8	28.8	34.9	33.0	35.3	33.2	23.4
	(1609)	(2409)	(3209)	(4009)	(4809)	
	17.4	19.1	21.4	17.8	12.2	
	25.8	23.8	25.9	27.9	20.0	
	31.9	26.3	28.3	30.1	22.6	
	36.3	31.2	33.1	37.7	24.2	

XTG INPUTS AND SCAN DATA EDIT FOR SUSQUEHANNA-2

NAME OR POINT ID	DESCRIPTION (ALL FLOWS IN MLB/HR ALL TEMPERATURES IN DEG F)	VALUE
*WT	TOTAL CORE FLOW USED IN H.B.	45.972
*WL	ACTIVE/TOTAL CORE FLOW FRAC	0.90000
NFP51	REACTOR PRESSURE (PSIA)	968.55
*MWT	CORE THERMAL POWER (MWT)	2050.7
*DHS	CORE INLET SUBCOOLING (BTU/LB)	-36.993
*ENDEL	CORE ENERGY INCREMENT (MWHT)	31.603
NM551	APRM READING(A)-CHAN 01 (%PWR)	63.637
NM553	APRM READING(C)-CHAN 02 (%PWR)	63.000
NM555	APRM READING(E)-CHAN 03 (%PWR)	62.962
NM552	APRM READING(B)-CHAN 04 (%PWR)	63.187
NM554	APRM READING(D)-CHAN 05 (%PWR)	62.637
NM556	APRM READING(F)-CHAN 06 (%PWR)	62.675
*HBFLAG	CTP CALC. (0-HT BAL, 1-APRM)	0.00000
NJP51	REACTOR CORE PRES. DROP (PSID)	2.5725
NEF51*K1	CRD FLOW (MLB/HR)	0.31500E-01
NLF51*K2	CLEANUP LOOP FLOW (MLB/HR)	0.10494
NLT52	CLEANUP LOOP INLET TEMP (DEGF)	526.50
NLT51	CLEANUP LOOP EXIT TEMP (DEGF)	439.05
NFL01(DCS)	REACTOR WATER LEVEL (INCHES)	35.537
NFF51	REACTOR STEAM FLOW	8.1067
GNJ02	GROSS GENERATOR POWER (MWE)	650.70
DFWFA	FW FLOW A,WGHTD AVE (MLB/HR)	2.6055
DFWFB	FW FLOW B,WGHTD AVE (MLB/HR)	2.7242
DFWFC	FW FLOW C,WGHTD AVE (MLB/HR)	2.6243
NRJ51	RECIRC PUMP A POWER (MW)	0.33618
NRJ52	RECIRC PUMP B POWER (MW)	0.13842
NFF52	FEEDWATER FLOW, A (MLB/HR)	2.5999
NFF53	FEEDWATER FLOW, B (MLB/HR)	2.7364
NFF54	FEEDWATER FLOW, C (MLB/HR)	2.6190
NBT51	FW TEMP 1 ,BRANCH A (DEGF)	346.96
NBT52	FW TEMP 2 ,BRANCH A (DEGF)	346.71
NBT53	FW TEMP 1 ,BRANCH B (DEGF)	344.64
NBT54	FW TEMP 2 ,BRANCH B (DEGF)	344.28
NBT55	FW TEMP 1 ,BRANCH C (DEGF)	344.67
NBT56	FW TEMP 2 ,BR2NCH C (DEGF)	344.08
NRF51*K3	RECIRC FLOW, A1 (MLB/HR)	6.4595
NRF53*K3	RECIRC FLOW, A2 (MLB/HR)	6.4208
NRF52*K3	RECIRC FLOW, B1 (MLB/HR)	5.2973
NRF54*K3	RECIRC FLOW, B2 (MLB/HR)	5.0999
NRT51	RECIRC TEMP, A1 (DEGF)	511.36
NRT52	RECIRC TEMP, A2 (DEGF)	510.24
NRT53	RECIRC TEMP, B1 (DEGF)	508.62
NRT54	RECIRC TEMP, B2 (DEGF)	508.75
*GENDEL	GENERATOR ENERGY INCR. (MWHE)	10.000

XTG INPUTS AND SCAN DATA EDIT FOR SUSQUEHANNA-2

NAME OR POINT ID	DESCRIPTION (ALL FLOWS IN MLB/HR ALL TEMPERATURES IN DEG F)	VALUE
*WTSUB	CORE FLOW FROM FUNCTION F4	50.787
NJF51	WT FROM J.P. OR INPUT (MLB/HR)	45.972
WD	TOTAL RECIRC FLOW	11.639
*WTFLAG	CORE FLOW FLAG	2.0000
*CRD	CONTROL ROD DENSITY	0.72973E-01
*CRDSYM	CONTROL ROD SYMMETRY FLAG	0.00000

*** FAILED SENSORS ***

CR:02-35 MAN | L32-49-C LOW | L24-33-B LOW | L48-33-C LOW | L40-25-A LOW